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EXAMINER

PIAZZA CORCORAN, GLADYS JOSEFINA

ART UNIT

1733

PAPER NUMBER

13

DATE MAILED: 03/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/761,301

Applicant(s)

SCHMIDT, RONALD P.

Examiner

Gladys J Piazza Corcoran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13, 15-24, 26-29, 32, 38, 39, 42, 43, 45 and 46 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

- 6) ☒ Claim(s) 13, 15-24, 26-29, 32, 38, 39, 42, 43, 45 and 46 is/are rejected.

- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7. 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

1. Figures 2, 3, and 9B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claims 39 and 43 both recite that the 3-D woven textile pre-form is in a Pi-shape, however the Specification does not recite the term Pi-shape. It is clear from the description of the specification and the drawings, particularly figures 4, 5, 6A, 7A, 7B, 7D, 9A and 9D that Applicant disclosed the 3-D woven textile pre-form as a Pi- shape, therefore there is no new matter. It is suggested to Amend the Application on page 10, line 22 after ““TT” pre-form” by inserting --, or  $\pi$  (Pi) shaped--.

### ***Claim Objections***

3. Claim 17 is objected to because of the following informalities: Claim 17, line 1 recites “said perform”, which should be --said pre-form--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 19, 38, 42, 45 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 19 recites that the step of curing is implemented with an E-beam cure resin system. However, claim 19 is dependent upon claim 16 which recites that the step of curing is implemented with heat and pressure. The Specification does not disclose an E-beam cure resin system and a heat and pressure curing, the Specification only discloses that the E-beam cure resin system is an alternative to heat and pressure curing in order to avoid thermal effects (page 3, lines 14-16 and page 10, lines 14-15). It is suggested to depend claim 19 from claim 13.

Claims 38 and 42 recite that the 3-D woven textile pre-form that is affixed to a first pre-cured assembly and at least one additional pre-cured assembly is T-shaped. The Specification only describes a T-shaped 3-D woven textile pre-form affixed to only one pre-cured assembly. There is no disclosure on a T-shaped 3-D woven textile pre-form affixed to at least two pre-cured assemblies.

Claim 45 recites that "the method further comprising tapering a thickness of the pre-form at an edge of said exterior surfaces of the pre-form." The Drawings (figures 4, 7A-D, 9A, 9D) do show a pre-form where the edges are tapered, however the Specification in its entirety does not show or describe a method of tapering a thickness

of the pre-form at an edge of said exterior surfaces of the pre-form. It is suggested to amend the claim to recite that the pre-form has tapered edges and to provide antecedent basis for such a limitation in the Specification.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 22 recites the limitation "said flexible material" in 1. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to --said pressure intensifier-- or to define the pressure intensifier as being made of a flexible material in claim 21.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 13, 15-18, 23, 24, 26, 27, 32, 39, 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breuer et al. (DE 19832441 C1 with English equivalent US Patent No. 6,306,239) in view of Abildskov (US Patent No. 4,782,864) and Hertzberg (US Patent No. 4,96,802).

Breuer discloses a method of forming a structural assembly by affixing a first pre-cured assembly (stringer core blanks 5) to a 3-D textile pre-form (stiffening profile members 7) impregnated with an uncured resin (column 4, lines 52-60; column 6, lines 9-26), affixing at least one additional pre-cured assembly (skin member 6) to said 3-D textile pre-form (stringer core blanks 5) (column 5, lines 23-40) and curing the resin to form the structural assembly (column 7, lines 30-55).

As to the limitation that the 3-D perform is woven, Breuer does disclose that pre-form is a fiber reinforced composite material of fiber textile materials (column 6, lines 18-26), however Breuer does not specifically disclose that the pre-form is woven. Abildskov discloses that an improvement of prior art methods with a pair of fabric connectors is to provide one three dimensional woven fabric connector in order to avoid peel problems of the prior art methods (figures 1, 3; column 2, lines 35-68). It would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of forming a structural assembly as shown by Breuer by providing a 3-D woven textile pre-form in order to overcome peel problems associated with using two fabric pieces (stringer core blanks 5) as shown by Abildskov.

As to the limitations of an adhesive film being located between the first pre-cured assembly and the pre-form, an additional adhesive film being located between the additional pre-cured assembly and the pre-form, and curing the adhesive films to form the structural assembly, Breuer only discloses curing the resin in the 3-D pre-form to provide the bonding between the pre-form and the two pre-cured assemblies.

Hertzberg discloses it is known in the art to provide an adhesive film between parts of

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structural assemblies in order to prevent delamination and provide a stronger bond than the prior art methods of only utilizing the resin in the parts for bonding when cured (column 1, lines 19-16; column 3, lines 25-31). Hertzberg further discloses that the adhesive film layers are placed between the joined surfaces of the parts of the structural assembly and then the structural assembly is cured (column 2, lines 55-68; column 4, line 47 to column 5, line 8; column 9, line 41). It would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of forming a structural assembly as shown by Breuer and Abildskov by providing adhesive film layers between the interfaces of 3-D pre-form and the pre-cured assemblies in order to reduce delamination and provide a stronger bond as shown by Hertzberg.

As to claims 15 and 24, Breuer discloses the pre-cured assemblies are pre-cured laminated composite structures (column 4, lines 51-60; column 5, lines 23-40). As to claim 16, Breuer discloses curing the structural assembly with heat and pressure (column 7, lines 30-55). As to claim 17, Breuer discloses an exterior portion of the pre-form that is not located between the pre-cured assemblies (see figures) and a pressure intensifier (vacuum bag in autoclave) in contact with the exterior surface of the pre-form applies pressure and presses the exterior portion against a portion of one of the pre-cured assemblies (column 7, lines 30-40). As to claims 18 and 27, Breuer discloses the step of curing is implemented by inserting the pre-cured assemblies and the pre-form into a vacuum bag and evacuating and heating the vacuum bag (column 7, lines 30-60). Clearly the adhesive films between the parts would also be inserted in the vacuum bag. As to claims 23 and 24, both Breuer and Abildskov show the pre-form having a base

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and a leg extending from the base at an angle (Breuer: base 71 and leg 72, see figure 3; Abildskov: base 72 and legs 76 and 80, see figure 3). As to claim 24, the adhesive film layers would be between all the surfaces of the pre-form and the pre-cured assemblies and therefore would be between the base of the pre-form and the pre-cured assembly and between the leg of the pre-form and the pre-cured assembly. As to claim 26, Breuer discloses the leg with an exterior portion that is not located between the pre-cured assemblies (see figures) and a pressure intensifier (vacuum bag in autoclave) in contact with the exterior surface of the leg of the pre-form applies pressure and presses the exterior portion of the leg against a portion of one of the pre-cured assemblies (column 7, lines 30-40). As to claim 32, the 3-D woven textile pre-form comprises at least one fiber woven through an intersection of the base and the leg in Abildskov (column 1, lines 30-68). As to claims 39 and 43, the 3-D woven textile pre-form in Abildskov has an additional leg extending from the base and is Pi-shaped (see figure 3).

11. Claims 17, 21, 22, 26, 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breuer et al. in view of Abildskov and Hertzberg as applied to claims 13, 16 above, and further in view of Barnes et al. (US Patent No. 6,007,894) and/or McKague Jr. (US Patent No. 6,374,570).

Breuer discloses the pre-form and the pre-cured assemblies are placed in a vacuum bag that is evacuated and heated for curing, where the evacuation causes pressure against having an exterior portion/surface of the pre-form not between the pre-cured assemblies to press the pre-form against the pre-cured assemblies (column 7, lines 30-55). Barnes discloses a method of curing a structural member by providing a



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pressure intensifier (silicone rubber blocks 221) against an exterior surface of a pre-form (body sheet 53), placing the pressure intensifier (221), pre-form (53) and structural assembly parts (43, 83) in a vacuum bag and evacuating the bag to cause the pressure intensifier to press the pre-form against the other structural assembly parts (see figure 25; column 8, lines 30-35, column 9, lines 14-33). McKague also discloses a method of curing a structural member by providing a pressure intensifier (35) against an exterior surface of a pre-form (11), placing the pressure intensifier (35), pre-form (11) and structural assembly parts (31, 33) in a vacuum bag (39) and evacuating the bag to cause the pressure intensifier to press the pre-form against the other structural assembly parts (figure 5 and column 4, lines –15). As to claim 22, the pressure intensifier in Barnes (silicone rubber blocks 221) and McKague (column 4, lines 9-10) is rubber. As to claim 26, the pressure intensifier in Barnes (see figure 25) and McKague (see figure 5) is in contact with the leg portion of the pre-form. It would have been obvious to one of ordinary skill in the art at the time of the invention to form the structural assembly as shown by Breuer, Abildskov and Hertzberg by providing pressure intensifiers in the vacuum bag during curing in order to provide pressure against the assembly parts for proper bonding as shown by Barnes and/or McKague.

As to claim 46, in addition to the limitations discussed above, Breuer discloses the pre-cured assemblies are pre-cured laminated composite structures (column 4, lines 51-60; column 5, lines 23-40); Abildskov discloses the woven textile has a base and a pair of legs extending from the base at an angle, defining a slot and corners at intersections of the legs and the base (see figure 3); since Hertzberg discloses applying

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adhesive between the interfacing surfaces of the structural assemblies, adhesive would be affixed between the base on an opposite side from the legs and the pre-cured composite, and between the inside surfaces of the legs in the slot and the second structure; Barnes (see figure 25) and McKague (see figure 5) show a pair of flexible pressure intensifiers having corner portions in contact with the corner portions of the pre-form.

12. Claims 19, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breuer et al. in view of Abildskov and Hertzberg (optionally Barnes and/or McKague) as applied to claims 16 and 26 above, and further in view of Leaversuch (Electron-Beam Treatment Upgrades a Range of High-Volume Materials) and/or McKague Jr. (US Patent No. 6,374,570) and/or Bersuch et al. (Affordable Composite Structure for Next Generation Fighters).

Breuer discloses curing the structural assembly with heat and pressure (column 7, lines 30-55). Leaversuch discloses E-beam treatment for curing polymers (for example epoxy) reduces speed cycles, tooling, manufacture and energy costs, and provides increased dimensional stability in a variety of areas including advanced composites for aerospace and transportation parts. McKague also discloses it is known when curing structural assemblies to alternatively use an E-beam treatment for curing the structures (column 4, lines 25-31). Bersuch also discloses E-beam treatment curing as a known method for curing structural assemblies (pages 1, 2, 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to perform the method of forming structural assemblies as shown by Breuer, Abildskov and Hertzberg

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by curing the resin in the structural assemblies through and E-beam treatment as shown by Leaversuch to reduce costs and increase dimensional stability in advanced composites for aerospace and transportation parts particularly since it is well known that the resin used in structural assemblies such as the ones in Breuer, Abildskov and Hertzberg is epoxy (see for example Hertzberg, column 1, line 68) and/or as shown by McKague and/or Bersuch as an alternative to heat curing in structural assemblies.

13. Claims 20, 29, 38, 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breuer et al. in view of Abildskov and Hertzberg as applied to claims 13, 16, 27, 24 above, and further in view of Bersuch et al. (Affordable Composite Structure for Next Generation Fighters) and/or Sheahen et al. (Robust Composite Sandwich Structures).

As to claims 20 and 29, Breuer disclose the pre-form has at least one exterior portion no located between the pre-cured assemblies. It is well known to apply additional composite overwrap plies on pre-forms for structural assemblies for a stronger joint bond. For example, Bersuch (page 9) and/or Sheahen (pages 6-7) both disclose applying composite overwrap plies on an exterior surface of a woven pre-form. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the method of forming a structural assembly as shown by Breuer, Abildskov, and Hertzberg by providing an overwrap ply over an exterior surface of the woven pre-form as shown by Bersuch and/or Sheahen in order to provide a stronger and more secure joint.

As to claims 38 and 42, it is well known to provide 3-D woven structures in a variety of shapes including T-shaped pre-forms. For example, Bersuch (pages 6, 9)

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and/or Sheahen (6) both disclose T-shaped pre-forms as alternatives to other shaped pre-forms such as the Pi-shaped pre-form disclosed in Abildskov. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the method of forming a structural assembly as shown by Breuer, Abildskov, and Hertzberg by providing a T-shaped pre-form as a well known alternative to a Pi-shaped pre-form as exemplified by Bersuch and/or Sheahen.

14. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Breuer et al. in view of Abildskov and Hertzberg as applied to claim 13 above, and further in view of Mueller et al. (US Patent No. 6,173,925) and/or Morris et al. (US Patent No. 5,944,286).

It is known to provide tapered edges on a pre-form for structural assemblies in order to provide a more aesthetic transition, to provide a greater surface area for bonding, and for better transmission of loads on the structural assembly. For example, Mueller discloses an example of a pre-form (27) in a structural assembly with tapered edges (figure 1; column 3, line 64 to column 4, line 23; column 4, lines 53-60). Morris discloses another example of a pre-form (6, 7) in a structural assembly having tapered edges (see figure 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a method of forming a structural assembly as shown by Breuer, Abildskov, and Hertzberg by providing the pre-form with a tapered edge as is well known in the art and exemplified by Mueller and/or Morris in order to provide a structural assembly with a more aesthetic transition, greater surface area for bonding,

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and better transmission of loads on the assembly. It is noted that Applicant has not asserted any criticality to the tapered edges.

***Response to Arguments***

15. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gladys J Piazza Corcoran whose telephone number is (703) 305-1271. The examiner can normally be reached on M-F 8am-5:30pm (alternate Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

  
Gladys J Piazza Corcoran  
Examiner  
Art Unit 1733

GJPC  
March 17, 2003